

REMARKS

Claims 1, 3-21, 23, 24, 26 and 27 are pending in this application. Claims 1, 23 and 24 are currently amended. Claims 3-6, 8, 9, 11, 13-16, 19-21, 26 and 27 are previously presented. Claims 7, 10, 12, 17 and 18 are original. Claims 2, 22 and 25 are cancelled, without prejudice. No new matter has been introduced.

In the present Office action, claims 1, 9 and 23 are rejected under 35 USC §102(b) as being anticipated by Jarvenkyla et al. U.S. 5,759,461. Claims 1-21, 23, 24 and 27 are rejected under 35 USC §103(a) as being obvious and therefore unpatentable over Jarvenkyla et al. '461 in view of Toyosumi et al. U.S. 6,565,938 and Hayakawa et al. U.S. 6,825,280. Claim 26 is rejected under 35 USC §103(a) as being obvious and therefore unpatentable over Jarvenkyla et al. '461 in view of Katz U.S. 6,127,662. We respectfully traverse.

In particular, Jarvenkyla et al. '461 discloses a method of forming a multilayer pipe for conducting fluids and thus is in the same field as the invention of the present application. The Examiner is correct in noting that Jarvenkyla et al. '461 does not make any disclosure regarding the materials of the multilayer pipe or the characteristics of the pipe. Neither of Toyosumi et al. '938 nor Hayakawa et al. '280 appears to be at all relevant to the invention underlying the present application.

In response, claim 1 has now been amended to introduce the feature of claim 2 into claim 1. The pipe which is now the subject of this amended claim will have a multilayer structure in which the bond between the outer layer and the inner layer is from 0.2 N/mm to 2.0 N/mm. This particular feature is important to the functioning of the pipe as a whole and is responsible for its success relative to other pipes when in use.

The patent specification recognizes that the surface of a plastics pipe can be damaged during the handling, installation and connection of the pipe. One way of overcoming this is to provide a protective outer layer, as disclosed in the patent specification. However, when joining two pipes together, it is necessary to have a clean outer surface of the pipe in the region of each of the two ends being joined.

In practice, this means that the outer layer of the pipe has to be peeled off. In the case of

conventional pipes with conventional protective layers bonded thereto, this is done using a peeling tool. In reality, however, a peelable protective layer is not easily removable and it is necessary to exert some force on the tool in order to achieve this result.

The Applicant has realized that by effectively reducing and controlling the adhesive strength of the bond between the skin layer and the inner core to the claimed range of 0.2 N/mm to 2.0 N/mm, it is possible to achieve a reliable and repeatable peeling of the pipe when joining the ends of two pipes together. Significantly, despite ensuring easy removal of the protective outer layer for the purposes of joining, it is still the case that the pipes of the present invention do not suffer from premature peeling of the outer layer during installation. Conventionally, it is expected that a lower adhesive strength between the inner and outer layers (such as would be needed to provide relatively easy peeling) will consequently lead to unwanted peeling of the pipe as it is pushed through a tunnel bored in the ground during installation. This is not the case with the pipe of the present application. Rather, Applicant has found that both installation and peeling can be effected using a pipe according to amended claim 1.

Turning now once again to the prior art, Jarvenkyla et al. '461 describes a pipe which can be seamed by peeling the outer layer off the area of the pipes to be seamed (see, e.g., col. 4, lines 20-22). In one variant of this pipe, the outer layer is moderately hard and can be detached from the pipe by knocking (see, e.g., col. 2, lines 33-37). In another variant of this pipe, the outer layer can be detached by applying heat to the outer layer (see, e.g., col. 3, lines 60-62). It is evident from the disclosure that the point underlying this prior art document is that the properties of the pipe as a whole are governed by the outer layer and that an ordinary pipe can be used in conditions where it would not otherwise be suitable as a consequence of the properties of the outer layer (see, e.g., col. 1, lines 43-50). In contrast, the outer layer of the pipe of the present invention is not specifically intended as a structural element, but rather as a protective element which can be easily removed to facilitate joining. Jarvenkyla et al. '461 does not recognize the importance of carefully controlling the adhesive strength between the skin and the inner core, but instead seeks to modify the properties of the outer layer in order to enhance the overall properties

of the pipe. Accordingly, amended claim 1 is novel and inventive over Jarvenkyla et al. '461.

Neither Toyosumi et al. '938 nor Hayakawa et al. '280 provides any further detail with respect to the adhesive strength between the outer layer and the inner layer of a plastics pipe. Indeed, it is submitted that it is not even appropriate to combine either one of those documents with Jarvenkyla et al. '461. In this regard, it is noted that Toyosumi et al. '938 relates to a laminate film used for food packaging applications and the like. This material contains EVOH and is principally intended to provide a gas barrier layer in packaging foods. The specification refers particularly to shrink packaging of food (see, e.g., col. 13, lines 50-52) and the use of the material to form vessels such as cups, trays, bottles, bags, etc as containers for foods (see, e.g., col. 14, lines 16-22). There is no reference to pipes intended for conducting fluids. It is therefore difficult to see why the skilled person would contemplate reading Toyosumi et al. '938 in conjunction with Jarvenkyla et al. '461, and indeed it is submitted that the skilled person would not do so.

Similarly, Hayakawa et al. '280 concerns a propylene polymer composition which has a good balance of properties such as rigidity and resistance to oxidation. There is no reference to the adhesive strength between layers of a laminate structure nor to the use of a material having a controlled adhesion between such layers to form a pipe for conducting fluids. It thus cannot be seen why a skilled reader looking at Jarvenkyla et al. '461 would also contemplate reading Hayakawa et al. '280 to obtain any further useful information.

Hence, it is submitted that the skilled person would not have any motivation to read either of Toyosumi et al. '938 or Hayakawa et al. '280 in conjunction with Jarvenkyla et al. '461. However, even if the skilled person did, for some reason read those documents together, it is still the case that the skilled person would not be provided with the feature of the adhesive strength between the skin and the inner core. This applies with similar effect with respect to the proposed addition of Katz '662.

Accordingly, we submit that amended claim 1, and all of the claim dependent therefrom, contain novel and inventive subject matter relative to the prior art.

Claim 23, which itself concerns a method for the production of a plastics pipe by co-extrusion, has been similarly amended to specify that molten polymeric materials are brought together and allowed to cool so that the adhesion of the skin layer to the inner core is within the range claimed in claim 2, i.e., from 0.2 N/mm to 2.0 N/mm when measured in the manner specified in Appendix 1. Accordingly, we submit that amended claim 23, and claim 24 dependent therefrom, also contain novel and inventive subject matter relative to the prior art.

The Examiner has also made objection to use of the term "whilst" in the claims (claim 26 is specified in the Office action, but the term actually appears in claim 24). Claim 24 is amended herein on response, replacing "whilst" with "while" as suggested by the Examiner.

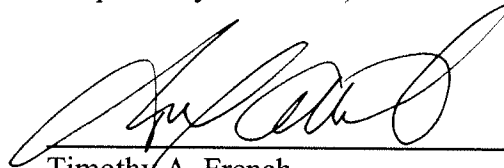
On the basis of the amendments and arguments set forth above, we submit that this patent application is now in condition for allowance. Early favorable action is solicited.

Please apply the fee for the Petition for Extension of Time, and apply any other charges or credits, to deposit account 06-1050.

Respectfully submitted,

Date: _____

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